ENZYMES

1. Oxidoreductases include*:*

a) Catalases and Mutases
b) Oxygenases and Dehydrogenases
c) Dehydrogenases and Ligases
d) Aminotransferases and Racemases
e) Epimerases and Oxidases

2. Michaelis constant of enzyme (Km) is*:*

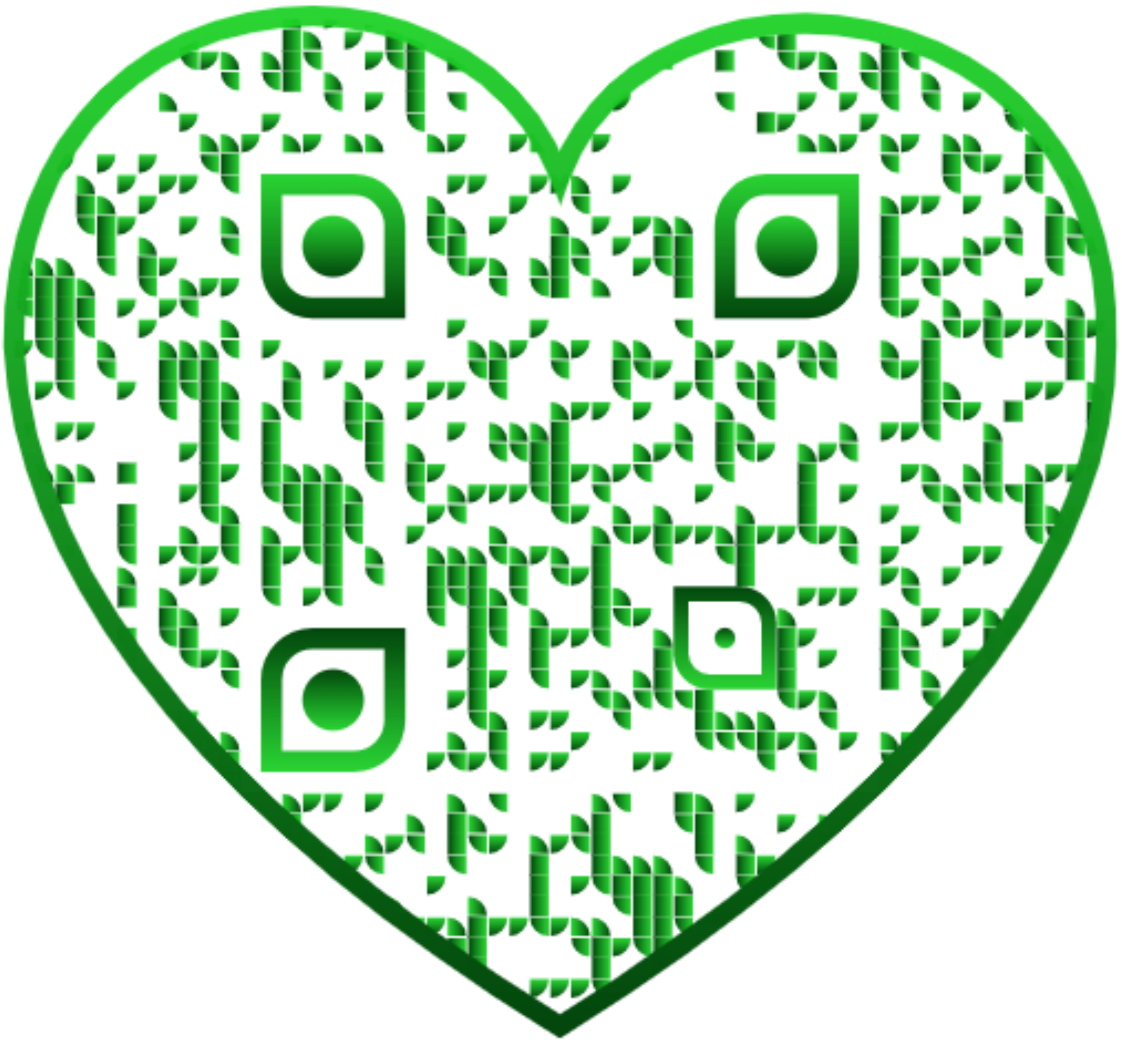
a) The substrate concentration which gives maximal velocity
b) The substrate concentration which gives 1/2 the maximal velocity
c) 1/2 the substrate concentration which gives maximal velocity
d) The enzyme concentration which gives maximal velocity
e) The enzyme concentration which gives 1/2 the maximal velocity

3. A competitive inhibitor*:*

a) Increases the Km of the enzyme
b) Decreases the Vmax of the enzyme
c) Increases the Vmax of the enzyme
d) Decreases the Km of the enzyme
e) Increases both Km and Vmax of the enzyme

4. The non-protein part of an enzyme is called:

a) Apoenzyme
b) Holoenzyme
c) Allosteric Enzyme
d) Isoenzyme
e) Coenzyme



5. The major 6 classes of enzymes include:

a) Transferases and Oxygenases

b) Isomerases and Lyases

c) Hydrolases and Epimerases

d) Oxidoreductases and Catalases

e) Transaminases and Transferases

6. Enzymes:

a) Increase the energy barrier for a reaction

b) Are recovered chemically altered after a complete reaction

c) Increase the equilibrium constant of the reaction

d) Activity is subject to regulation

e) Are exclusively proteins

7. Coenzymes

a) The non-protein part of enzymes

b) Needed for enzyme activity

c) Usually vitamin derivatives

d) Termed prosthetic group if bonded tight to their enzymes

e) All of the above are correct

8. At Vmax of an enzyme catalyzed reaction:

a) Further increase in substrate concentration increases the rate of the reaction

b) All the enzyme molecules are combined with substrate

c) The substrate concentration that produces maximal velocity is termed Km

d) Half the enzymes are combined with substrate

e) Km is maximum

9. In case of non-competitive inhibition of enzymes

a) Vmax can not be reached

b) There is no significant alteration of the active site

c) Inhibitor is structurally similar to the substrate

d) Inhibitor can be removed by increasing substrate concentration

e) Vmax is increased

10. Isoenzymes:

a) Are factors required for enzyme activity

b) Are functional plasma enzymes

c) Show similar responses to inhibitor molecules

d) Are important tools in the diagnosis & prognosis of disease

e) Catalyze oxidation-reduction reactions

11. Hydrolases enzymes include:

a) Racemases and oxygenases

b) Isomerases and lyases

c) Peptidases and lipases

d) Oxidoreductases and catalases

e) Transaminases and hydralases

12. Which of the following statements is true of enzyme catalysts?

a) To be effective they must be present at the same concentration as their substrate

b) They can increase the equilibrium constant for a given reaction by a thousand-fold or more

c) They lower the activation energy for conversion of substrate to product

d) Their catalytic activity is independent of pH

e) They are generally equally active on D and L isomers of a given substrate

13. Allosteric effector influences the enzyme activity by:

a) Covalently modifying the enzyme

b) Binding to the substrate and altering its conformation

c) Competing for catalytic site with substrate

d) Changing the specificity of the enzyme for its substrate

e) Binding to a site on the enzyme distinct from catalytic site

14. The following enzyme complex requires both thiamine and lipoic acid:

a) Malate dehydrogenase

b) Alpha-ketoglutarate dehydrogenase

c) Fumarase

d) Isocitrate dehydrogenase

e) Succinate dehydrogenase

15. Sterioisomers:

a) Diversify physical and chemical properties of molecules

b) Have the same spatial configuration

c) Exhibit enzyme specifity

d) Include epimers, anomers and enantiomers

e) All A, C and D are correct

16. In an enzyme catalyzed reaction:

a) Enzymes increase the energy barrier for the reaction

b) Enzymes form a perminant complex with the substrate

c) After the reaction, enzymes are recovered unchanged

d) V-max is reached in the presence of a non-competitive inhibitor

e) The equilibrium constant is decreased

17. Isomerases:

a) Racemases and mutases

b) Phosphatases and hydratases

c) Lyases and oxidases

d) Transaminases and kinases

e) Hydratases and glucosidases

18. Subclasses of oxidoreductases include:

a) Kinases and oxygenases

b) Reductases and dehydrogenases

c) Racemases and oxidases

d) Catalases and aminotransferases

e) Peroxidases and anomerase

19. The active site of an enzyme:

a) Is rich with hydrophobic amino acid side chains

b) Binds allosteric effectors

c) Is similar in shape to the substrate

d) Occupies most of the enzyme molecule

e) None of the above

20. Coenzymes:

a) Are small organic molecules needed for enzyme activity

b) Are associated with apoproteins

c) Are vitamin derivatives

d) Are called prosthetic groups if they are tightly bound to the enzyme

e) All of the above is correct

21. In competitive inhibition of an enzyme:

a) Km and Vmax are decreased

b) Inhibitor is structurally similar to the substrate

c) Inhibition cannot be reversed by increasing substrate concentration

d) Vmax is decreased

e) The inhibitor binds to the regulatory site on the enzyme

22. In non-competitive inhibition of enzyme activity:

a) Both Vmax and Km are increased

b) Inhibitor has no structural resemblance to the substrate

c) There is a significant alteration of the active site

d) Vmax is decreased

e) A is the only wrong answer

23. The following statements describe Allosteric enzymes:

a) Effectors may enhance or inhibit substrate binding

b) Binding of the substrate to the Allosteric site displaces the effectors

c) They are always multimeric proteins
d) The regulatory site is identical to the active site
e) Binding of substrate to the active site releases allosteric effector

24. The following statements about regulation of enzyme activity are correct:

a) Phosphorylation/ dephosphorylation is the common covalent modification
b) Regulatory enzymes usually catalyze reversible reactions
c) Allosteric inhibitors are usually the end products
d) Increase in the enzyme level has no effect
e) Irreversible inhibition is physiological type of regulation

25. Phosphorylation/ dephosphorylation of enzymes:

a) Occurs on specific serine and threonine residues
b) Is a covalent type of modification
c) Is a reversible type of regulation
d) Is achieved by the activities of protein kinases and phosphatases
e) All of the above is correct

26. The enzyme for starch digestion is:

a) Salivary amylase
b) Pancreatic amylase
c) Lysosomal glucosidase
d) Both A and B
e) All of the above is correct

27. Hydrolases include:

a) Catalases and mutases
b) Oxygenases and dehydrogenases
c) Esterases and glucosidases
d) Aminotransferases and racemases
e) Epimerases and oxidases

28. The following enzymes are absent in muscles but are present in the liver:

a) Pyruvate carboxylase and citrate synthase
b) Glucose-6-phosphatase and glycerol kinase
c) Lactate dehydrogenase and isocitrate dehydrogenase
d) Pyruvate dehydrogenase and beta-ketothiolase
e) Glycogen synthase and 3-HMG CoA synthase

29. Which of the following statements is true of enzyme catalysts?

a) To be effective, they must be present at the same concentration as their substrate
b) They can increase the equilibrium constant for a given reaction by a thousand-fold or more
c) They lower the activation energy for conversion of substrate to product
d) Their catalytic activity is independent of pH
e) They are generally equally active on D and L isomers of a given substrate

30. Isoenzymes:

a) Are differentiated by dialysis

b) Show the same electrophoretic mobility
c) Include lactate dehydrogenase
d) Are used as diagnostic tools
e) Both C and D are correct

31. The pancreatic enzyme not involved in protein digestion is:

a) Carboxypeptidase
b) Trypsin
c) Lipase
d) Elastase
e) Chymotrypsin

32. Restriction enzymes:

a) Recognize specific nucleotide sequences in DNA
b) Cut both strands of DNA
c) Often produce single stranded tails
d) Do all of the above
e) Do none of the above

33. Enzymes involved in hydrolysis:

a) Are called decarboxylases
b) Use folic acid as a coenzyme
c) Include dehydrogenases
d) Include peptidases
e) Always require coenzyme

34. Enzymes and pH:

a) All enzymes have one optimum pH
b) Enzymes in the stomach require alkaline pH
c) All enzymes in eukaryotic cells require the same pH

d) The optimum pH is the one at which the enzyme has maximum activity

e) The pH is the same in the lysosome and plasma

35. Isomerases:

a) Catalyze oxidation-reduction reactions

b) Do not change the structural formula of the substrate

c) Include transaminases

d) Use water to break covalent bonds

e) Require ATP to form covalent bonds

36. The following vitamin work as coenzymes with the corresponding enzyme:

a) Biotin and carboxylases

b) Cobalamin with isomerases

c) Retinol with lyases

d) Riboflavin with hydrolases

e) Thiamin and isomerases